

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. – 19. (Canceled).

20. (New) A system for performing a maintenance test between LAN connecting devices in which a plurality of LAN connecting devices that are connectable to a LAN and that are capable of recognizing a signal up to the OSI layer 2 are connected to each other through a circuit using an optical fiber as a physical medium configured such that communication is possible between the LAN connecting devices using an optical signal of a first input / output wavelength for performing ordinary LAN communication and an optical signal of a second input / output wavelength for maintenance communication relating to communication on said circuit connecting the LAN connecting devices to each other,

wherein one of said LAN connecting devices comprises:

an optical collector for collecting the optical signal of said first input / output wavelength and an optical signal of said second input / output wavelength and transmitting them to said circuit;

a first communication data control part for performing ordinary LAN communication processing and outputting the optical signal of the first input / output wavelength outputted by the LAN communication processing to said optical collector; and

a first maintenance data control part for outputting a maintenance signal for performing maintenance test processing of communication to said optical collector as the optical signal of the second input / output wavelength, and

wherein the other of said LAN connecting devices comprises:

an optical distributor for separating the optical signal transmitted by said circuit to said first input / output wavelength and said second input / output wavelength and outputting each of them;

a second communication data control part for performing the ordinary LAN communication processing by the optical signal of the first input / output wavelength outputted by said optical distributor; and

a second maintenance data control part for performing said maintenance test processing of communication by the optical signal of the second input / output wavelength outputted by said optical distributor,

wherein the maintenance test is performed on a path between said LAN connecting devices by the signal of the OSI layer 2.

21. (New) A system for performing a maintenance test between LAN connecting devices in which a plurality of LAN connecting devices that are connectable to a LAN and that are capable of recognizing a signal up to the OSI layer 2 are connected to each other through a circuit using an optical fiber as a physical medium configured such that communication is possible between the LAN connecting devices using an optical signal of a first input / output wavelength for performing ordinary LAN communication and an optical signal of a second input / output wavelength for notifying a communication state on said circuit connecting the LAN connecting devices to each other,

wherein one of said LAN connecting devices comprises:

an optical collector for collecting the optical signal of said first input / output wavelength and an optical signal of said second input / output wavelength and transmitting them to said circuit;

a first communication data control part for performing ordinary LAN communication processing and outputting the optical signal of the first input / output wavelength outputted by the ordinary LAN communication processing to said optical collector; and

a first maintenance data control part for performing failure monitoring processing and outputting alarm information obtained by the failure monitoring processing to said optical collector as the optical signal of the second input / output wavelength, and

wherein the other of said LAN connecting devices comprises:

an optical distributor for separating the optical signal transmitted by said circuit to said first input / output wavelength and said second input / output wavelength and outputting each of them;

a second communication data control part for performing the ordinary LAN communication processing by the optical signal of the first input / output wavelength outputted by said optical distributor; and

a second maintenance data control part for performing failure processing by the optical signal of the second input / output wavelength outputted by said optical distributor,

wherein transmission of said alarm information from one of said LAN connecting devices to the other of said LAN connecting devices is performed by the signal of the OSI layer 2.

22. (New) A system for performing a maintenance test between LAN connecting devices in which a plurality of LAN connecting devices that are connectable to a LAN and that are capable of recognizing a signal up to the OSI layer 2 are connected to each other through a circuit using an optical fiber as a physical medium configured such that communication is possible between the LAN connecting devices using an optical signal of a first input / output wavelength for performing ordinary LAN communication and an optical signal of a second input / output wavelength for notifying a state of the LAN connecting device on said circuit connecting the LAN connecting devices to each other,

wherein one of said LAN connecting devices comprises:

an optical collector for collecting the optical signal of said first input / output wavelength and an optical signal of said second input / output wavelength and transmitting them to said circuit;

a first communication data control part for performing ordinary LAN communication processing and outputting the optical signal of the first input / output wavelength outputted by the ordinary LAN communication processing to said optical collector; and

a first maintenance data control part for performing power-state monitoring processing and for outputting a power-off signal obtained by the power-state monitoring processing to said optical collector as the optical signal of the second input / output wavelength,

and wherein the other of said LAN connecting devices comprises:

an optical distributor for separating the optical signal transmitted by said circuit to said first input / output wavelength and said second input / output wavelength and outputting each of them;

a second communication data control part for performing the ordinary LAN communication processing by the optical signal of the first input / output wavelength outputted by said optical distributor; and

a second maintenance data control part for recognizing the power-off of one of said LAN connecting devices by the optical signal of the second input / output wavelength outputted by said optical distributor,

wherein transmission of said power-off signal from one of said LAN connecting devices to the other of said LAN connecting devices is performed by the signal of the OSI layer 2.

23. (New) A system for performing maintenance between LAN connecting devices in which a plurality of LAN connecting devices connectable to a LAN are connected to each other through a circuit, said system comprising:

means for recognizing, by using a test communication code being in a different form from an ordinary LAN communication code, said test communication code separately from an ordinary LAN communication and for separating an ordinary communication and a test communication from each other on the basis of code data;

path testing means for testing a path between said LAN connecting devices.

24. (New) A system for performing maintenance between LAN connecting devices in which a plurality of LAN connecting devices connectable to a LAN are connected to each other through a circuit, said system comprising:

means for recognizing, by using an alarm communication code being in a different form from an ordinary LAN communication code, said alarm communication code separately from an ordinary LAN communication and for separating an ordinary communication and an alarm communication from each other on the basis of code data; and

means for performing an alarm transfer between said LAN connecting devices.

25. (New) A system for performing maintenance between LAN connecting devices in which a plurality of LAN connecting devices connectable to a LAN are connected to each other through a circuit, said system comprising:

recognition means for recognizing a type code of a test communication different from an ordinary LAN communication by utilizing a value not used in an ordinary LAN communication address or a length or a type code not existing in a protocol between terminals of a physical communication or between terminals of a logical communication, and a separation means for separating an ordinary LAN communication and said test communication from each other; and

securing means for securing a path between said LAN connecting devices by way of said test communication.

26. (New) A system for performing maintenance between LAN connecting devices in which a plurality of LAN connecting devices connectable to a LAN are connected to each other through a circuit, said system comprising:

recognition means for recognizing a type code of an alarm communication different from an ordinary LAN communication by utilizing a length or a type code not existing in an ordinary LAN communication protocol between terminals of a physical communication or between terminals of a logical communication, and a separation means for separating an ordinary communication and said alarm communication from each other; and

alarm notification means for performing an alarm notification between said LAN connecting devices by way of said alarm communication.

27. (New) A system for performing maintenance between LAN connecting devices in which a plurality of LAN connecting devices connectable to a LAN are connected to each other through a circuit using a twisted pair cable as a physical medium, said system comprising:

means for separating from each other the input/output speed of an ordinary communication and the input/output speed of a test communication between terminals of a physical communication or between terminals of a logical communication and performing a test communication at the same time as an ordinary communication or at an optional time; and

connection confirmation means for performing connection confirmation by way of a test communication sent at regular or irregular intervals.

28. (New) A system for performing maintenance between LAN connecting devices in which a plurality of LAN connecting devices connectable to a LAN are connected to each other through a circuit using a twisted pair cable as a physical medium, said system comprising:

means for separating from each other the input/output speed of an ordinary communication and the input/output speed of an alarm communication between terminals of a physical communication or between terminals of a logical communication and performing an alarm communication at the same time as an ordinary communication or at an optional time; and

alarm notification means for performing the alarm communication at regular or irregular intervals.

29. (New) A method for performing maintenance between LAN connecting devices connected to a LAN, said method being provided with a system having test communication means for operating in parallel with an ordinary LAN communication independently of the said LAN communication and thereby monitoring an ordinary LAN communication signal and a test communication signal used in a test communication in a reception means for receiving communication information from a circuit and recognizing a test state by separating an ordinary communication state and a test communication state, and being provided with a means for transmitting and receiving said test signal,

said method comprising the steps of:

making a test monitoring device transmit a test signal to a LAN connecting device to be a tested device;

making said LAN connecting device transmit a test completion identifying response signal to said test signal to said test monitoring device;

making said test monitoring device confirm the normality on the basis of the state of reception of this response signal; and

securing a communication operation between said LAN connecting devices.

30. (New) A LAN connecting device having a function to be connected to a LAN and a function to recognize a signal up to the OSI layer 2, being connected to its opposite party LAN connecting device through a circuit using an optical fiber as a physical medium and being capable of communication with said opposite party LAN connecting device using

an optical signal of a first input / output wavelength for performing ordinary LAN communication and an optical signal of a second input / output wavelength for maintenance communication relating to communication on, said circuit comprising:

an optical distributor for separating the optical signal transmitted by said circuit to said first input / output wavelength and said second input / output wavelength and outputting each of them;

a communication data control part for performing the ordinary LAN communication processing by the optical signal of the first input / output wavelength outputted by said optical distributor; and

a maintenance data control part for performing maintenance test processing of communication by the optical signal of the second input / output wavelength outputted by said optical distributor,

wherein a maintenance test is performed for a connection path with said opposite party LAN connecting device by the signal of the OSI layer 2.

31. (New) A LAN connecting device having a function to be connected to a LAN and a function to recognize a signal up to the OSI layer 2, being connected to its opposite party LAN connecting device through a circuit using an optical fiber as a physical medium and being capable of communication with said opposite party LAN connecting device using an optical signal of a first input / output wavelength for performing ordinary LAN communication and an optical signal of a second input / output wavelength for notifying a communication state on, n being a positive integer, said circuit comprising:

an optical collector for collecting an optical signal of said first input / output wavelength and an optical signal of said second input / output wavelength and transmitting them to said circuit;

a communication data control part for performing the ordinary LAN communication processing and outputting the optical signal of the first input / output wavelength outputted by the ordinary LAN communication processing to said optical collector; and

a maintenance data control part for performing failure monitoring processing and outputting alarm information obtained by the failure monitoring processing to said optical collector as the optical signal of the second input / output wavelength,

wherein transmission of said alarm information to said opposite party LAN connecting device is performed by the signal of the OSI layer 2.

32. (New) A LAN connecting device having a function to be connected to a LAN and a function to recognize a signal up to the OSI layer 2, being connected to its opposite party LAN connecting device through a circuit using an optical fiber as a physical medium and being capable of communication with said opposite party LAN connecting device using an optical signal of a first input / output wavelength for performing ordinary LAN communication and an optical signal of a second input / output wavelength for notifying the state of its own device on, said circuit comprising:

an optical collector for collecting an optical signal of said first input / output wavelength and an optical signal of said second input / output wavelength and transmitting them to said circuit;

a communication data control part for performing the ordinary LAN communication processing and outputting the optical signal of the first input / output wavelength outputted by the ordinary LAN communication processing to said optical collector; and

a maintenance data control part for performing power-state monitoring processing and outputting a power-off signal obtained by the power-state monitoring processing to said optical collector as the optical signal of the second input / output wavelength,

wherein transmission of said power-off signal to said opposite LAN connecting device is performed by the signal of the OSI layer 2.

33. (New) A LAN connecting device connectable to a LAN and connected to its opposite party device through a circuit, said LAN connecting device comprising:

recognition means for recognizing a test communication code being in a different form from an ordinary LAN communication code;

separation means for separating an ordinary communication and a test communication from each other on the basis of code data when recognizing said test communication code by means of said recognition means; and

test means for testing a path to said opposite party device by way of said test communication code.

34. (New) A LAN connecting device connectable to a LAN and connected to its opposite party device through a circuit, said LAN connecting device comprising:

recognition means for recognizing an alarm communication code being in a different form from an ordinary LAN communication code;

separation means for separating an ordinary communication and an alarm communication from each other on the basis of code data when recognizing said alarm communication code by means of said recognition means; and

alarm transfer means for alarm-transferring a device status to said opposite party device by way of said alarm communication code.

35. (New) A LAN connecting device connectable to a LAN and connected to its opposite party device through a circuit, said LAN connecting device comprising:

recognition means for recognizing, as a test communication code, a value not used in an ordinary communication address or a length or a type code not existing in a protocol between terminals of a physical communication or between terminals of a logical communication;

separation means for separating an ordinary communication and said test communication from each other by means of said recognition means; and

test means for performing a test between said LAN connecting device and said opposite party device by way of said test communication at regular or irregular intervals.

36. (New) A LAN connecting device connectable to a LAN and connected to its opposite party device through a circuit, said LAN connecting device comprising:

recognition means for recognizing, as an alarm communication code, a length or a type code not existing in an ordinary LAN communication protocol between terminals of a physical communication or between terminals of a logical communication;

separation means for separating an ordinary communication and said alarm communication from each other by means of said recognition means; and

alarm notification means for notifying said opposite party device of a device status by way of said alarm communication.

37. (New) A LAN connecting device connectable to a LAN and connected to its opposite party device through a circuit using a twisted pair cable as a physical medium, said LAN connecting device comprising:

separation means for separating from each other the input/output speed of an ordinary communication and the input/output speed of a test communication between terminals of a physical communication or between terminals of a logical communication; and

test means for performing a test communication at the same time as an ordinary LAN communication or at an optional time,

wherein said LAN connecting device performs a connection confirmation by way of the test communication at regular or irregular intervals.

38. (New) A LAN connecting device connectable to a LAN and connected to its opposite party device through a circuit using a twisted pair cable as a physical medium, said LAN connecting device comprising:

separation means for separating from each other the input/output speed of an ordinary communication and the input/output speed of an alarm communication between terminals of a physical communication or between terminals of a logical communication; and

alarm communication means for performing an alarm communication at the same time as an ordinary communication or at an optional time,

wherein said LAN connecting device notifies its opposite party device of a device status by way of the alarm communication.